

Responses to Suggestions for Sustainability at Western Illinois University

During Western Illinois University's (WIU) 2008 Environmental summit students presented posters on envisioning a sustainable WIU community. Student teams analyzed eleven separate areas of sustainability and benchmarked current WIU sustainability initiatives with other universities. Preferred recommendations are presented as a result of surveys of students, faculty, and staff attending the Summit as well as each team rank ordered their own priorities.

The font color represents responses and comments prepared by Facilities personnel. The responses discuss the probability that a suggestion could be implemented at WIU by making note of overall expected impact and resource requirements needed to implement. Student suggestions that include ongoing initiatives at WIU are noted as well.

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Energy Recommendations



1. Invest in solar power as a primary source.

<http://www.news.cornell.edu/stories/Dec06/DayHallSolar.ws.html>

Solar power is not regarded as technically feasible in this area of Illinois. Solar power using current technology could only provide a very small portion of our total power requirements and could not be a primary source of power for WIU at this time. This would be true even after aggressive steps were taken to dramatically reduce power consumption on the WIU campus. Solar power is also the most expensive renewable energy alternative at over 4 times the expected capital cost of wind generation. As with many evolving technologies, solar power may become more viable for application at WIU in the future. The intermittency of available sunlight, considerable cloudiness in this region, short winter daylight hours, and night time hours make

solar an unsuitable choice for a primary source of power. Storage of large quantities of electricity during the day which would be needed at an institutional facility is also considered cost prohibitive. Likewise, there are only limited applications for thermal storage from passive solar applications.

See <http://www.eia.doe.gov/cneaf/solar.renewables/ilands/fig11.html>

See also, Energy Information Administration, Annual Energy Outlook, 2000, for relative capital costs of renewable and fossil fuel generation technologies.

2. Invest in wind power as a secondary source.

http://www.ulsf.org/pub_declaration_spotvol42-2.htm

Wind power applications have been studied extensively for use at WIU. This area of Illinois is not regarded as technically viable for wind turbine applications at this time. However, the University has been actively seeking ways to purchase wind power either as a partner in a major wind farm located in the state or through long term power contracts. Each alternative presents substantial financial risks to WIU. Evaluation continues in order to find ways that these risks may be managed so that procurement of wind power could be feasible for a portion of the WIU electrical power portfolio.

Future wind turbine technology could improve so that this renewable becomes more feasible in this area of Illinois. However, serious consideration would have to be given by the WIU administration on whether owning, operating, and maintaining wind turbines is an operational competency that WIU should acquire. An industrial sized wind application needed to supply the significant quantities of electricity that WIU needs requires resources and professional skills that WIU does not currently have, and which would be difficult and expensive to acquire.

As with solar power, the intermittency of wind availability creates financial risk. This risk is most significant in peak electrical use summer months as this corresponds with minimal seasonally affected wind speeds and extremely high prices in the spot electrical procurement market. The spot market or futures commodity market would likely be where WIU would have to acquire make-up power whenever its assigned wind assets were idle.

Please see wind evaluation report prepared for WIU attached to the Sustainability Website.

Use campus-wide high efficiency lighting.

<http://www.plantservices.com/vendors/products/2006/069.html>

In FY07 \$216,256 of high efficiency lighting retrofits were installed in Stipes and Morgan Halls. Currently, lighting in Malpass Library is being retrofit at an estimated cost of \$343,256. In FY09 Salle, Brophy, Horrabin, Tillman and Browne will receive lighting retrofits at a total estimated cost of \$396,125. Another \$59,373 has been invested in compact florescent lighting technology, occupancy sensors, and LED exit lighting on campus. Combined, this \$1 million, three year investment is expected to result in an avoided electrical cost savings of \$220,000 a year, a 4.4 year simple return on that investment. Lighting efficiency upgrades will continue on the WIU campus as resource requirements allow.

3. Replace windows and insulation to increase retention of heat and light.

Window replacements perform marginally as an energy conservation initiative in institutional buildings and have one of the slowest energy savings paybacks on investment. There are many more substantive energy conservation opportunities on the campus which should be accomplished before window replacements, given the very constrained capital environment the University exists in.

At the time of the preparation of this response, WIU has an approximate \$350 million deferred maintenance liability and has not received capital renewal from the State in over five years. Even if the annual \$1.2 million capital renewal increment resumes, many of the highest capital renewal priorities are not energy conservation related.

Window replacement is a priority in the deferred maintenance list for other performance and aesthetic reasons.

4. Combine heating and power plant.

Combined heat and power (CHP) could be a very workable solution to our campus utility and energy needs. CHP is being evaluated in summer of 2008 as part of the WIU Utility Infrastructure Master Plan. CHP and combined cycle systems could provide enhanced electrical and thermal energy reliability and improved economy while greatly reducing environmental impact. While WIU would need to acquire new competencies to own, operate, and maintain a CHP plant, this technology is time-tested. Accordingly, CHP is considered highly reliable, a requirement for University utility operations. A CHP plant is also more consistent with current WIU Plant maintenance and operations skills than are most renewable sources of power. In summary, CHP could be advantageous to

WIU. However, also see discussions on coal versus gas fuels below as these issues relate to combined heat and power plants.

5. Use controlled ventilation. Highly efficient maintenance of pressure and humidity provides clean air.

Direct Digital Controls (DDC) is integral to any Heating Ventilating and Air Conditioning (HVAC) modernization project in campus buildings. DDC systems save energy by allowing for highly repeatable and easily monitored control of complex HVAC equipment and their operation cycles. DDC should be used to provide proper comfort at optimal energy use, not as a means to reduce energy use by sacrificing comfort and consequently productivity. WIU installs DDC as available resources allow.

Invest in a methane power system-a clean burning gas with little waste that could be used for powering large grids.

Uncertain as to the focus of this suggestion to prepare adequate response - See discussion of natural gas in other discussion below.

6. Invest in front load washers and dryers.

Being implemented by the University Housing and Dining Services.

7. Eliminate coal as a power source. http://www.huffingtonpost.com/robert-f-kennedy-jr/coals-true-cost_b_74738.html

The University receives purchased power which is likely produced predominantly by coal-fired generation plants in the region. WIU also heats and cools its buildings with steam produced in its Heating Plant using approximately 50% coal and 50% natural gas.

While a University gas fired CHP plant could provide some independence from coal fired electrical generating plants, the economics of the natural gas market in the 35 to 40 year lifecycle of a new plant is highly uncertain. The open natural gas market where WIU procures its industrial gas resources routinely experiences extreme price fluctuations. This volatility has resulted in \$1+ million (<30%) utility budget deficits at WIU. Likewise, the cost to produce steam in a campus thermal plant with gas will typically range from 3 to 7 times the cost to produce steam with Illinois coal. High prices and volatility of natural gas has a substantial impact on the cost of education at WIU which can not be overlooked by the University Administration.

Using 2008 WIU utility budget fuel estimates, replacing coal fired steam with natural gas fired steam at the WIU heating plant would increase campus utility costs by an estimated \$294 per student per year, or \$9.80 per semester hour at 15 credit hours per semester. At current 2008 prices for May delivery of natural gas, an estimated increase per student of \$380 per year would equal \$12.65 per semester hour. Debt service to cover capital costs to convert to all natural gas in the WIU heating plant might also increase utility expenses \$1.5 to \$2.00 per semester hour.

The complexity involved with choosing appropriate utility infrastructure and fuel supply is that the highly desirable priorities of cost efficiency, system reliability, and environmental sustainability can not yet be mutually achieved at maximum desirable levels to satisfy all stakeholders. It may be that some type of proven clean coal technology combined with biomass and supplemented with a portfolio utilizing wind power as an offset is the most optimal long term answer to the University's utility infrastructure needs. A commitment by the University to stay current with clean coal technology advancements as opposed to "grandfathering" its Plant is an important policy consideration that might lessen environmental concerns as well as provide positive carbon trading opportunities for WIU. Again, the ongoing Utility Infrastructure Master Plan will examine utility plant options from an economic, system reliability, environmental impact, and social policy perspectives.

8. Install turf roofs.

http://www.safeguardeurope.com/applications/green_roofs.php

A sedum roof is to be installed on the new Multicultural facility and will be evaluated for other campus applications.

9. Invest in geothermal heating. <http://www.usageothermal.com/>

Geothermal is being used at the new Multicultural facility and the new Quad Cities Campus. Geothermal may be evaluated for use in supplementing a new chilled water plant proposed for the WIU campus in Macomb.

10. Power diesel vehicles with vegetable oil.

<http://ozarksfirst.com/content/fulltext/?cid=21075>

11. Encourage President Goldfarb to sign the American College and University President Climate Commitment.

<http://www.presidentsclimatecommitment.org/html/commitment.php>

The President's Climate Commitment continues to be evaluated by the University Administration. The WIU Physical Plant intends to begin preparing a carbon inventory (carbon footprint) for the campus in FY09.

12. Convert to flat screen/LCD monitors.

All new CPUS are equipped with flat screen energy savings monitors.

Power down one day a week. Universities could turn the power off for one day a week to conserve energy, finances, and non renewable resources

The University has ongoing functions and residences that require power, heat, and air conditioning on a continuous basis. Powering down is problematic because the large mass of institutional buildings consisting of concrete and steel are capable of storing large thermal gains and also require lengthy recovery of thermal losses. This underscores a primary difference between residential and institutional buildings that is often misunderstood. Stored heat in summer, or lost heat in winter resulting from powering down would be overcome by running HVAC equipment at maximum capacity levels for longer periods of time. The requirement to reject or add heat subsequently uses more energy and is substantially more stressful on mechanical equipment in buildings. Powering down in freezing temperatures is also risky for pipes and other HVAC equipment. During unplanned utility failures, University employees have had to employ overtime hours to drain pipes, cooling towers, and air handling units to safeguard these systems from permanent catastrophic damage.

13. Switch to motion sensor lighting.

The University Physical Plant has been adding motion sensors in appropriate applications on campus as available funding and labor hours allow.

13. Encourage people to use the stairs not the elevators.



Pollution Reduction Recommendations

1. Set and adhere to goals to drop a percentage of pollution output every year. **(1)**

http://www.afm.ars.usda.gov/shem/files/Pollution_Prevention_Policy&Strategy_Final2.PDF

A set pollution reduction goal could require funding and resources not currently available to the University as well as the use of untested and potentially less reliable technologies. However, the University has taken steps to reduce pollution by voluntarily recycling its fluorescent light bulbs and encouraging recycling. The University continues to evaluate reductions, sharing, and reuse of regulated materials in labs. The University will continue to evaluate waste reduction in every aspect of its operations and will implement those initiatives whenever practical.

Find a new source of water for campus.

There is no known positive pollution impact or sustainability advantage for the University to construct and operate its own water utility.

2. Use more “green” products on campus. **(4)**

http://www.regreenprogram.org/documents/product_checklist.pdf

The University uses significant numbers of “green” products in cleaning products, office supplies, and equipment. WIU has adopted “green” purchasing guidelines. Additional information is available on the WIU Sustainability Website under the annual Lt. Governor Sustainability Reports and WIU procurement guidelines.

3. Implement a campus water filtration system to eliminate boil orders.

<http://www.filterswater.com/water-purification/reverse-osmosis.htm>

While the University water supply comes from the city of Macomb, WIU voluntarily meets safe water drinking standards of the Illinois EPA. This consists of weekly monitoring and monthly reporting to the IEPA on proper chlorine residuals as well as routine testing at a State licensed lab for bacteriological contamination. The WIU Physical Plant employs a licensed water operator as required by State rules to fulfill these requirements.

Further filtering of the city water supply would be very expensive and require maintenance labor not available to the University Physical Plant. Filtering could require increased pumping energy, reduce system reliability, and would not likely alleviate the need for city initiated boil orders.

4. Create an organization that will educate the campus and community about pollution reduction (especially student and staff dumping of chemicals). **(2)**
<http://nemo.osu.edu/>

The University Physical Plant employs a deputy Director for Safety and Environment who works closely with campus departments that dispose of regulated wastes. These entities are currently working with representatives of the Illinois EPA and an environmental consulting firm to update procedures to reduce regulated and unregulated wastes. WIU contracts for recycling pickup, maintains a recycling program for normal waste, and recycles palettes, tires, batteries, electronic equipment and monitors, some construction materials and metals of all types.

5. Involve existing organizations in pollution reduction. **(3)**

See above response in #4.

6. Increase alternative transportation viability by limiting personal vehicle access to campus and increasing efficiency and access of alternatives.
<http://www.aashe.org/resources/transportation.php>
7. Reduce or eliminate emissions from the coal burning power plant.

See responses above regarding ongoing Utility Infrastructure Master Planning.

8. Have school officials speak with physical plant and determine needed actions to reduce pollution output.

Physical Plant maintains the University's Title V permit for regulated emissions and employs engineers that evaluate pollution controls, monitoring, and all reporting requirements. Administrative officials at WIU and Physical Plant readily communicate on all aspects of utility production and pollution control.

See responses above regarding ongoing Utility Infrastructure Master Planning as well as pollution reduction initiatives.

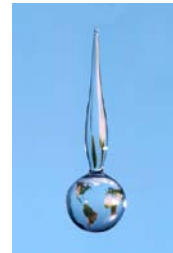
9. Organize a committee to focus primarily on the plant and set up plans for WIU to move away from using coal as the primary power source.
http://www.gasification.org/Docs/2007_Papers/33WAKE.pdf

A WIU Utility Infrastructure Master Planning Committee exists. Membership is open to interested persons and campus outreach is planned for all stages in the planning process.

See responses above regarding ongoing Utility Infrastructure Master Planning and coal fuel issues.

Water Conservation Recommendations

1. Set specific goals of what needs to be accomplished to save water on campus.



Water reduction goals should be set as suggested. However all goals and objectives will be dependent on resource availability. Please see how resource availability is handled in the campus Energy Management Plan adopted by the WIU Board of Trustees, also found as a link in the Campus Sustainability Webpage.

2. Install low-flow toilets and waterless urinals.

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WIU Physical Plant installs low flow fixtures as resources allow. Waterless urinals are a violation of the State of Illinois Plumbing Code and may not be used at WIU. Low flow fixtures are required on new construction and on renovation as resources allow.

3. Monitor the amount of water used for landscaping and other maintenance on campus. <http://www.inmtn.com/html/water/water.htm>

Campus irrigation is minimal. Only athletic fields are equipped with irrigation systems. The campus golf course is watered from ponds that collect rain water. The campus landscape utilizes many varieties of native or naturalized planting materials and maintains two natural prairie restorations on its main campus. Most irrigation is provided manually as needed for establishing new tree plantings on campus and to water valuable vegetation.

4. Educate students, especially those who live in dorms, on how to conserve water during their everyday tasks.

UHDS and Physical Plant will work together on water and energy conservation education in campus residence halls.

5. Research grey water treatment systems and rainwater collection structures for irrigation use. <http://www.equaris.com/>

See discussion in item #3 above. Some lower cost options for grey water systems, natural storm water retention ponds, below grade reservoirs in parking areas, and rain gardens would be good storm water management techniques for campus. Please see previous discussions on the state of campus deferred maintenance priorities and funds availability.

6. Install low-flow shower heads in dorms and university buildings.

Some low flow shower heads have been installed in campus buildings. Physical Plant, UHDS, Athletics and Kinesiology, should further develop this initiative as a campus sustainability goal.

7. Turn off automatic toilet flushers in all university buildings and residences.

Uncertain as to the focus of this suggestion to prepare an adequate response.

8. Install automatic sensor faucets.

WIU Physical Plant installs automatic sensor for faucets as resources allow.

9. Test the hot water system to provide hot water to faucet within 60 seconds maximum.

The speed with which hot water is available at a location in a building will depend on hot water system piping design and location of the hot water heater. With two-pipe systems, hot water is continually circulated through out the building by a circulation pump. In these systems hot water availability can be immediate. In single pipe systems, the distance of any water outlet from the hot water heater and storage tanks will determine how long it will take to receive hot water. This is generally true even when hot water pipes are well insulated. Conversion of a single pipe system to a two-pipe system in an existing building is typically cost prohibitive because there is no easy way to install an extra set of pipes in the building. It is unclear whether the extra cost of a two-pipe system and the energy used by the circulation pump is offset by the assumed cost savings from less water usage due to faster access of domestic hot water. However, two-pipe systems are highly desirable in large institutional and residential campus buildings for improved convenience and sanitation.

Recently Physical Plant installed a tankless flash hot water system in Currens Hall which produces hot water on demand. While these systems do save

energy, it is too early to determine if the application of this system in Currens will be successful.

10. Implement water saving contests that encourage students to conserve more water than their peers.

Water conservation contests may be possible in residence halls. Physical Plant and UHDS will discuss the possibilities of holding contests for education and awareness.

11. Install a rainwater collection and/or a grey water system in dorms and university buildings.

<http://www.gdrc.org/uem/water/rainwater/introduction.html>

See discussion above in Item #5.

12. Set up a website discussing water conservation issues relating to WIU and the community.

The Campus Sustainability Website provides a venue for covering water conservation issues on the WIU campus.

Transportation Recommendations

1. Provide free bike rentals for campus members.
2. Increase the bio-diesel blend used in 'Go West' busses.
3. Implement a half-priced parking permit system for carpools of 3 or more members.
4. Establish a 'Yellow Bike' program allowing universal use of campus bikes by students and staff.
5. Restrict the sale of parking permits from 1st and 2nd year students.
6. Do not collect bike registration fees.
7. Create a reward system for those who register a bike.
8. Sell fewer parking permits or reduce current parking lot space.
9. Increase penalties for parking without permits.



10. Host environmental and health seminars to increase awareness.
11. Install “pull over” areas for buses to pick up students to allow the flow of traffic to continue and reduce idle time for non-bus traffic.
12. Install bike lanes on campus.
13. Coordinate with the City of Macomb to install bike lanes on roads that lead onto the campus.
14. Have a university “Walking Day” where people who walk to class get rewarded. (Supported by student organizations)
15. Install digital signs at bus stops that inform riders of time to next bus arrival. <https://netfiles.uiuc.edu/ro/www/IlliniBicycleProject/>

Other university programs for consideration:

WIU has purchased seven Prius Hybrids in the past two years for its rental fleet, a hybrid for the President’s Office, and one hybrid for the Physical Plant administrative office. Transportation Services runs the highest blended ethanol percentage in its sedans that will operate effectively within certain seasonal temperature ranges. Physical Plant is hoping to purchase an electric maintenance vehicle in FY09.

16. Flexcar and Zipcar- Car-sharing programs where a person reserves a car for a trip, picks up the car, and then returns the car to a drop off point. A real alternative to owning a car.
17. University of Wisconsin uses twenty percent bio-diesel for their buses.
18. University of Georgia has built an ethanol plant that can produce 150 thousand gallons of ethanol per year.
19. University of Maine has a program that allows campus members to rent bikes for free.
20. Stanford University has a campus bike shop.
21. The University of Michigan allows only juniors and seniors to purchase campus parking permits.
22. Duke University has half-priced permits for any three people willing to carpool.
23. Rice University produces bio-diesel from waste vegetable oil that’s generated on campus.
24. American Solar Challenge – many universities across the nation design and build solar-powered cars to increase knowledge of environmental awareness.

25. The University of Waterloo has a “Yellow bike” program that gives students and staff the ability to use university bikes.
26. Cal Poly campus has over 2,000 bike rack spaces and 90 secure bike lockers available on campus.
27. The University of Toronto has opened a new “Self Help” bike repair shop.
28. Duke University has a triangle transit authority program, which provides emergency transportation for those who choose not to drive.



Food Systems Recommendations

1. Implement a closed loop food system. (producing food by reusing waste) (Dickinson College, PA) **(2)**
 - a. collect food waste
 - b. compost the food waste (University of Kansas)
 - c. use the compost as fertilizer in the campus garden/greenhouse
 - d. use the produce grown in the garden/greenhouse in the dining halls
http://www.hospitalityupdate.co.uk/index.php?option=com_content&task=view&id=316
2. Encourage the use of washable/reusable dinnerware to prevent the added waste of using disposable flatware. (Duke University) **(7)**
3. Buy locally to help prevent some of the cost and pollution that is associated with buying food from large farms that are far away. (Portland State University and University of California at Berkeley) **(13)**
4. Implement a large scale composting project. **(3)**
5. Educate students and visitors about sustainable dining practices by placing table cards at each dining table and putting up posters. (Portland State University) **(4)**
6. Set aside land for a larger scale campus-community farm. The farm could be used by the university for growing produce that could be used in campus cafeterias. (University of New Hampshire) **(14)**
<http://alpha.dickinson.edu/storg/sisa/>
7. Have organic food selections at each meal where people would have the option of choosing organic food. (University of California at Berkeley) **(6)**
8. Be willing to accept and expand upon sustainable changes that Sodexo offers to produce better



- outcomes with respect to food supply and wastes. (Portland State University) **(8)**
9. Give a mug at the beginning of the year to each first-year student. Every time the mug is used, the student receives a discount. (Bowdoin College at Brunswick, ME) **(12)** <http://www.bowdoin.edu/sustainability/living-local/dining-hall-sustainability.shtml>
 10. Broaden the Garden Club idea and have WIU introduce a class that is agriculturally based and has a lab where the students would go out and take care of the garden. **(5)**
 11. Develop a campus restaurant or dining center with a sustainable food theme. This restaurant would support organic, local, and seasonal food. (University of California at Berkeley) **(10)**
 12. Develop an organic food night with one organic AND sustainable meal. (University of Wisconsin-Madison) **(9)**
 13. Develop a harvesting crew that travels to local farms and helps harvest some of the crops that would later be used by the university. (Brown University) **(11)**
 14. Set aside land for a smaller scale on-campus garden where a student-run group could manage the garden. Students could work in the garden and the produce could be sold to make money for the university or to help improve sustainability in other areas. (Yale University) **(14)**
 15. Construct campus greenhouses for food production. **(1)**
 16. Change the school year. **(16)**



Green Building Recommendations

1. Implement solar electrical panels, wind turbines, and solar water heating. **(1)**

See previous discussions regarding wind and solar applications on campus.

Campuses with multiple buildings can achieve capital and operational cost savings and better energy efficiencies through centralization of utility production as opposed to decentralization (utilities produced at the facility). The term “diversity” refers to the timing differences of daily peak demands in each facility on a campus. Diversity means that less installed capacity is needed to satisfy campus utility demands in a centralized plant. Centralization saves on operational costs as maintenance is confined to one facility where fewer pieces of equipment are installed. Chilled water diversity for a proposed chilled water plant on the WIU campus was modeled by computer at 70%. Accordingly, the

“whole” (centralized chiller plant) requires less capacity “than the sum of its parts” (individual building chillers) by a factor of 30%.

2. Use locally manufactured construction materials, composed of recycled content. **(2)**

Locally manufactured construction materials using recycled materials are thought to very limited in the west central Illinois region, if existent at all.

3. Super-insulate floors using recyclable materials to reduce energy consumption. **(3)**

<http://www.chicagoreader.com/greenchicago/sullivanhouse/>

Since most campus buildings are located over basement areas, floors which are insulated beyond what is normally required for sound transmission adds cost but no additional energy saving advantages. Building orientation, wall and roof insulation, type of glass, location, size, orientation and overhangs for windows are important considerations for all new campus buildings.

The source cited above by the students is a story on energy savings for a residential facility. There are significant differences in how residential and institutional campus buildings consume energy and react to climate changes. Economic feasibility of initiatives used in residential applications can be much less attractive in institutional buildings due to occupancy density and the structural mass of these facilities.

4. Install white roofs that require less cooling for buildings in hot weather. **(4)**

Some argue that a white roof is better in the south for solar reflectivity while black is better in the north for solar heat retention in the winter. The WIU campus is typically more heating than cooling intense. A green roof that uses various types of live sedum is perhaps the best energy performers. However, with constrained construction budgets, the cost and benefits of a “green” roof should be weighed against other energy savings opportunities. The increased structural capacity to support the heavier “green” roof, and more stringent code compliance issues are factors which will increase initial building costs of a “green” roof.

5. Use rain water cisterns in all new buildings.

The cost of the tanks and structure to support a cistern as well as additional piping systems, rudimentary treatment or filtering, and heating of the water in winter may limit the range of buildings where cisterns are cost effective. Local codes may also impact use and costs of cisterns.

6. Install heat recovery ventilators that recapture heat from outgoing air.
<http://www.toolbase.org/Technology-Inventory/HVAC/energy-recovery-ventilators>

Heat wheels installed on laboratories, gymnasiums or facilities with significant exhaust requirements are thought to be marginally viable in some applications. However, project budgets are always limited. Accordingly, the cost and return for installing heat recovery equipment should be compared to other energy savings initiatives that could be installed in the building at a comparable cost. Heat wheel applications are potentially less viable as a retrofit to existing buildings.

7. Install dynamic monitoring systems that adjust lighting and ventilation.
<http://www.energysmart.com.au/sedatoolbox/esm9.asp>

See discussions above on DDC control systems and lighting controls.

8. Use 100% outside ventilation air in all occupied spaces.

Using 100% make-up air from outside to ventilate buildings when the temperature and humidity of the outside air is in the proper range can be effective. These systems, also known as “economizers”, are found on some WIU buildings. It is very difficult however to retrofit existing facilities with an economizer if it was not originally designed as part of the HVAC system. It should also be noted that proper outdoor temperature and humidity conditions for economizer cycles are limited to only a few weeks or months during the year.

9. Use grey water to water greenhouse plants.

10. Commit to LEED guidelines in renovation as well as new construction.

WIU committed to designing and constructing all new buildings to “Silver” LEED standard or better in 2006 when it pledged 9 of the 12 sustainability initiatives of the Illinois Lt Governor’s sustainability compact.

11. Install a living machine (an artificial marsh) that treats waste water.
<http://www.toddecological.com/ecomachines.html>

Open wastewater treatment would not be suitable for application on the WIU campus. Storm water retention ponds when properly designed can reduce pollution inflow into waterways like the La Moine River. Several storm water retention projects may be very desirable for WIU.

12. Recycle grey water from showers to preheat water going into the water system.

This type of heat recovery system would not likely be very cost effective.

13. Install data monitoring and display systems that visually show energy and cycling of matter that support the building. **(5)** http://www.news.com/8301-10784_3-9726200-7.html

See previous discussions in the energy section which cover Direct Digital Control systems (DDC) in buildings.

14. Divert construction waste from landfills.

Part of the LEED certification earned on campus buildings will come from recycling construction waste whenever practical to do so.

Academic Sustainability Recommendations

<http://www.aashe.org/resources/programs.php>

1. Create an environmental studies major. **(2)**
2. Implement a general education requirement class on sustainability. **(1)**
3. Create student-run organizations focusing on sustainability in diverse areas of the curriculum. **(5)**
4. Require teachers to integrate service learning projects in sustainability into their curriculum. **(3)**
5. Offer co-curricular classes dealing with sustainability in specific majors.
6. Incorporate a regularly recurring sustainability theme on campus, perhaps every five years. **(4)**
7. Offer certification classes on environmental sustainability.
8. Allow an option for independent study on conservation and sustainability.
9. Offer graduate programs in relation to environmental sustainability.
10. Create a program where students concerned with environmental sustainability and conservation can live together in the same residence halls.



Recycling Recommendations

<http://www.pfd.muohio.edu/recycling/index.jsp>



1. Purchase and place more recycling containers around campus. **(3)**

This initiative is being accomplished as resources permit.

2. Create a program directed at recycling food scraps to reduce landfill waste.

More study is needed to determine if WIU can safely and effectively capture food scraps for making compost. Some food scraps are ground and disposed of through the city sewer system and do not go to the landfill. A sanitary food diversion process would have to be developed to collect, store, and facilitate transport of food waste to a composting facility. It is unclear whether the University has adequate resources to implement this initiative at this time. The WIU Physical Plant has purchased a Composting Machine for turning its landscape wastes into composted mulch.

3. Purchase composting tubs for food waste. **(4)**

See above discussion in #3.

4. Incorporate the sorting of trash in residence halls for recyclable material. **(2)**

Most WIU residential halls were designed for central trash chute disposal to an incinerator room. When incineration was being employed, Physical Plant Building Service Workers sorted trash from recyclables. However, when incineration was stopped by WIU, the University had to install remote outdoor refuse packers where waste is transported manually. This continual daily transport of refuse covers a distance of over 100 feet in some buildings. The increased labor to transport this waste does not allow for Physical Plant to sort recyclables without either a reduction in cleaning services or an increase in labor costs to campus housing. The Physical Plant and University Housing and Dining Services continue to review ways to facilitate better recycling in residence halls. However, recycling in residence halls should be promoted more as an individual behavioral choice than as a service to be provided by Building Service Workers.

5. Initiate a cell phone and rechargeable battery recycling program. (Ithaca)
6. Dispose of cooking oil to a contractor who resells the filtered end product as vegetable diesel. (Ithaca)
7. Have the bookstore collect and reuse packaging materials. (Ithaca)
8. Encourage and financially assist apartment complexes around campus to recycle. **(5)**

9. Encourage labs on campus to trade with other universities in order to save money and greatly reduce chemical waste.

Lab chemical sharing is being evaluated at WIU to reduce the use and disposal of regulated materials.

10. Engage in promotional efforts to increase recycling and recycling awareness.

The University continues to look for ways to promote proper recycling habits by Students, Faculty, and Staff.

11. Hire a sustainability coordinator. **(1)**

Physical Plant has requested a Sustainability Coordinator Position in 2008.

Purchasing Recommendations

http://www.aashe.org/resources/purchasing_links.php



1. Use food sources without pesticides or artificial growth hormones. Dining halls should abide by the “Fish List,” a nationally recognized guideline for eco-friendly and sustainable seafood purchases. **(6)**
2. Replace current cleaning products with water and citrus based cleaning ones, which is even more sustainable than only using Green Seal products. **(5)**

These products would require testing by Physical Plant Building Services Workers before they could be adopted universally. See the WIU, Lt. Governor annual sustainability report for progress on use of “Green Seal” cleaning products on campus.

3. Work with Sodexho to purchase from local growers, processors, and manufacturers. **(3)**
4. Resell university’s old technology items. **(4)**
5. Install roll towels and/or hand dryers in bathrooms around campus to use instead of paper towels. **(7)**

Various roll towel dispensers have been tested on campus. Installation of hand dryers can be cost prohibitive in existing buildings where electrical availability and capacity is limited.

6. Refurnish old furniture and allow students to reuse it instead of throwing away items when offices and classrooms are upgraded. **(8)**

7. Form a co-operative for common purchases with the Macomb and Quad Cities communities. This would help to promote environmentally friendly purchases outside of Western and would help to offset the costs by purchasing on a mass scale. **(2)**
8. Institute a mandatory centralized purchasing for all items, as opposed to departments making their own purchases for non-common equipment as is done now. Central purchasing requires all departments to go through one office to order supplies, and that office then can make sure the supplies are environmentally friendly. **(1)**
9. Install more battery recycling drop boxes.
10. Implement a plastic bag recycling program around campus in response to the high volume of purchases through Wal-Mart and other various stores by university students.

Student Life Recommendations

<http://www.aashe.org/competitions/>

1. Create a recycling program with a company such as Waste Wise. **(4)**
2. Implement an organization dedicated to sustainable food raising. **(9)**
3. Create bike trails on campus. **(10)**
4. Apply for recycling grants. **(7)**
5. Build an alternative fuels research building. **(11)**
6. Integrate mandatory environmental Greek “educationals” with existing yearly Greek “educational.” **(2)**
7. Hold competitions among residence halls and Greek houses in recycling or energy saving. **(5)**
8. Train and support “Green Residence Hall Assistants.” **(1)**
9. Implement one or more green residence halls. **(6)**
10. Practice sustainability with volunteer clean-up crews after university-sponsored events. **(3)**
11. Collaborate with the University Union Board and artists who do “Green Tours” through carbon offsets. **(8)**



Native Landscaping Recommendations

<http://www.inhs.uiuc.edu/~kenr/prairienativelinks.html>



Purple Coneflower
Echinacea purpurea

1. Compost and use the compost as fertilizer. **(1)**

See compost discussion above under the section on food”.

2. Recycle demolished construction materials as landscaping borders. **(2)**

Some demolished materials have been used for riprap erosion control and planned drive extensions behind Physical Plant.

3. Use only natural pesticides and organic fertilizer. **(3)**
4. Expand/improve campus wetlands. **(4)**
5. Install planting islands and education gardens using only native plants. **(5)**
6. Use only organic fertilizer.
7. Use only native plants.
8. Install a rain garden. **(6)**
9. Use native plants to create green roofs on campus. **(7)**

See discussion on green roofs in the “Buildings” section above.

10. Form a committee or club that would research the possibilities of native landscaping and begin to implement some of the suggested changes.

A Campus landscape Committee and Master Planning Implementation Team are in place and have discussed implementation of native landscaping on campus. See discussions above on campus prairie restorations and irrigation under the “water” section.

11. Involve students and faculty by putting together a competition for who can plan the best landscapes around “their” buildings.

WIU can not landscape specific buildings on campus beyond what currently exists due to available labor resources. WIU labor resources are in line with other universities for appropriate number of personnel.

In many of the team reports, biases in the survey data collected were mentioned. Many suggested separating the surveys of students who were filling them out as quickly as possible for extra credit in their classes rather than informing themselves with the information available and then responding. At least one team did not consider survey responses and used personal opinions. These biases should be taken into consideration when utilizing the suggestions.

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MAY 18,